Online Collaboration and Project Management Technologies Exposed:
"Harvard Design School Study on the Value of OCPM Software and Services"

March 8-9, 2006 Cambridge MA
Burçin BECERIK

Research Findings
Value Assessment
Suitability & Industry Practices
Online Collaboration and Project Management Technology

<table>
<thead>
<tr>
<th>Team Communication and Document Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>support various modes of communication, act as a repository of various documents, allow storage, sharing and timely exchange of information and project documents</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Work Flow and Process Automation</th>
</tr>
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<tbody>
<tr>
<td>support various business models by managing the flow of information, monitoring and recording the progress of tasks as a result reduces cycle time, automate workflow</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Process and Project Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>support process and project monitoring and management, provides better management of the resources</td>
</tr>
</tbody>
</table>
1. Interviews

December ‘04 – July ‘05

102 interviews with 81 industry stakeholders

2. Case studies

Business Collaborator – UK
   Nationwide Building Society, Royal Bank of Scotland (ITG Group)

Constructware – USA
   Abbott Laboratories (TRM Healthcare), Indianapolis Public Schools,
   P.J. Dick Incorporated

eBuild.ca – Canada
   Inscape Corporation

Meridian Systems – USA
   Kitchell Contractors, Manhattan Contractors

Primavera – USA
   LA Unified School Districts

3. Aggregate data
<table>
<thead>
<tr>
<th>INTANGIBLE</th>
<th>soft benefits</th>
<th>QUASI-TANGIBLE</th>
<th>TANGIBLE</th>
<th>hard benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>new income/value</td>
<td>increased income/value</td>
<td>avoided costs</td>
<td>new income/value</td>
<td>increased income/value</td>
</tr>
<tr>
<td>ability to refer back to data</td>
<td>decreased work flow turnaround and faster transactions</td>
<td>reduced errors &amp; omissions</td>
<td>O&amp;M: improved project delivery; early occupancy</td>
<td>reduced/saved staff requirement</td>
</tr>
<tr>
<td>enables international links</td>
<td>improved quality of the output</td>
<td>minimizing project risks</td>
<td></td>
<td>reduced transaction costs</td>
</tr>
<tr>
<td>better information version control</td>
<td>better communication; fewer information bottlenecks</td>
<td>increased income/value</td>
<td></td>
<td>decreased # of RFI/COs</td>
</tr>
<tr>
<td>better forecasting and control</td>
<td>greater integration &amp; process automation</td>
<td>advanced purchase of materials</td>
<td></td>
<td>reduced storage requirements</td>
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<tr>
<td>organizational level benefits</td>
<td>improved idea sharing among team members</td>
<td></td>
<td></td>
<td>reduced litigations and discovery costs</td>
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<td></td>
<td>improved capture of design/ construction decisions</td>
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<tr>
<td>Improved company image – RBS</td>
<td>Improved data availability 4.35/5</td>
<td>reduced mistakes</td>
<td></td>
<td>decreased # of RFI/COs</td>
</tr>
<tr>
<td>Gained Market Access – Inscape</td>
<td>Improved audit trail 4.19/5</td>
<td>better risk management</td>
<td></td>
<td>decreased spending on administration staff &amp; materials</td>
</tr>
<tr>
<td>Improved Customer Relationships – Inscape</td>
<td>Improved information management 4.00/5</td>
<td></td>
<td></td>
<td>reduced communication costs</td>
</tr>
<tr>
<td>Gained Negotiation Power – Inscape</td>
<td>Faster reporting and feedback 4.00/5</td>
<td></td>
<td></td>
<td>less service workers</td>
</tr>
<tr>
<td>Strategic competitive advantage – PJ Dick, Manhattan</td>
<td>Accurate/timely information to give valid/accurate decisions 3.97/5</td>
<td></td>
<td></td>
<td>reduced litigations and discovery costs</td>
</tr>
<tr>
<td>Claims Mitigation and Management – LAUSD</td>
<td>Improved process automation 3.95/5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forecasting – LAUSD</td>
<td>Improved version control 3.93/5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Knowledge Management Nationwide</td>
<td>Better project/program control 3.84/5</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Process reengineering – Nationwide, RBS, LAUSD</td>
<td>Timely capture of decisions 3.63/5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fewer information bottlenecks 3.57</td>
<td></td>
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</tr>
</tbody>
</table>

**Tangibles: Savings**

example #1: e-RFIs

"The tool is saving time because everything is standardized. Now if I want, I can pull out some reports and understand where we stand."

Brian Killion (Manhattan Construction Company)
Senior Project Manager
**Tangibles: Savings**
example #1: e-RFIs

“There is no doubt the tool improves the RFI process. We used to have 12 days turnaround time but now it is possible within hours.”

Jack I. Jones, CMU Collaborative Innovation Center Superintendent, P.J. Dick, Inc.

### e-RFI Turnaround

<table>
<thead>
<tr>
<th>Turnaround - 5 days</th>
<th>5.38</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turnaround - 7 days</td>
<td>6.01</td>
</tr>
<tr>
<td>Industry Average</td>
<td>14</td>
</tr>
</tbody>
</table>

(based on 7 projects and 5028 e-RFIs)
Less time spent on issuing/answering an RFI

5 min vs. 45 min

We can estimate the savings with a basic calculation:
Number of RFIs = 130
Average salary of construction administrator = $40,000/year ($25/hour)
Time spent to process an RFI = 45 minutes (3/4 of an hour) with traditional method
¾ X 130 X 25 = $2437

45 minutes vs. 5 minutes
SAVINGS: (2437/9) X 8 = $2166 per project

Assume there are 10 projects in the office
2166 X 10 = $21,660 per year

“Somewhere along the line, shorter RFI turnaround time should improve the construction schedule and reduce the costs if you are receiving hundreds of RFIs and reducing the turnaround time to 2 days.”
Michael McDonald, Abbott BioResearch Center
Tangibles: Savings
example #1: e-RFIs

Decrease in the number of RFIs

No evidence!

“RFIs are related to the quality of the documents. If someone has a question, he has a question. However, it is easier for the primes to access and review the entire list of questions. In addition, the system clears up the question early in the process in a speedier manner. This avoids mistakes and solves problems early in the process.”

Jack Metcalf, Riverside Elementary School Project Manager, Schmidt Associates
Tangibles: Savings

example #2: e-document transfer
FedEx charges for 7 lbs between the destinations:

<table>
<thead>
<tr>
<th>Region</th>
<th>Next day</th>
<th>2 day</th>
</tr>
</thead>
<tbody>
<tr>
<td>A to B</td>
<td>$54.34</td>
<td>$11.55</td>
</tr>
<tr>
<td>B to A</td>
<td>$54.34</td>
<td>$11.55</td>
</tr>
<tr>
<td>A to C</td>
<td>$70.61</td>
<td>$17.54</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$179.29</strong></td>
<td><strong>$40.64</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quarter</th>
<th># of drawings posted</th>
<th># of packages shipped</th>
</tr>
</thead>
<tbody>
<tr>
<td>2nd Qrt of 2003</td>
<td>6742</td>
<td>134</td>
</tr>
<tr>
<td>3rd Qrt of 2003</td>
<td>6271</td>
<td>124</td>
</tr>
<tr>
<td>4th Qrt of 2003</td>
<td>5428</td>
<td>108</td>
</tr>
</tbody>
</table>

Assume 50 drawings will weight 7lbs. Assume half of the packages are sent by 2nd day shipping and the other half is sent by next day shipping.
**Tangibles: Savings**

example #2: e-document transfer

<table>
<thead>
<tr>
<th></th>
<th>Q2-2003</th>
<th>Q3-2003</th>
<th>Q4-2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>Savings</td>
<td>$12,012</td>
<td>$11,116</td>
<td>$11,877</td>
</tr>
<tr>
<td>Savings</td>
<td>$2,723</td>
<td>$2,520</td>
<td>$2,195</td>
</tr>
<tr>
<td>Total</td>
<td>$14,735</td>
<td>$13,636</td>
<td>$11,877</td>
</tr>
</tbody>
</table>

**Total Savings:**

<table>
<thead>
<tr>
<th>Time</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 months</td>
<td>$40,248</td>
</tr>
<tr>
<td>1 year</td>
<td>$53,664</td>
</tr>
<tr>
<td>3 years</td>
<td>$160,992</td>
</tr>
</tbody>
</table>

$53,664 per project; the company has at least 10 similar size/type projects every year!
**Tangibles: Savings**

example #3: e-bidding

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Variables:
- Engineer hourly rate: $37.00
- Administrative staff hourly rate: $18.00
- Printing 30 sets of plans (30 full-sheet pages) and specifications (200 pages) = $1000
- Overnight shipping of one solicitation package: $15.00

Variables not included in cost estimating:
- Normal print request and mailing varied between 30 to 50 packages, sometimes more for larger projects.
- Solicitation amendments not included; average of two per solicitation over-nighted ($5) to prospective bidders (50) (estimated $6,000 additional cost)

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Any realized savings for the design review or project administration segments of a construction project only enhance the ROI. I usually quote a low $100,000 in savings that is realized over the annual cost of our site. ($68,000)

Jay Burris, GSA Project Manager
Engineer Administration time: $37.00 x 6 hours = $222 x 8 projects = $1,776 x 6 Project Managers = $10,656 (288 hours)

Contracting Officer Administrative time: $37.00 x 6 hours = $222 x 8 projects = $1,776 x 4 Project Managers = $7,104 (192 hours)

Administrative Support time: $18.00 x 8 hours = $144 x 20 projects = $2,880 x 6 Project Managers = $5,760 (320 hours)

Total Associate indirect costs: $10,656 + $7,104 + $5,760 = $23,520 (800 associate hours expensed)

Printing costs: 30 sets = $1,000 x 20 solicitations = $20,000

Mailing costs: 30 sets x $15 (one box and one tube) = $450 x 20 solicitations = $9,000

Total direct costs: $20,000 + $9,000 = $29,000

Direct and indirect costs associated with solicitations issued during one fiscal year (Oct - Sep) $29,000 (direct) + $23,520 (indirect) = $52,520 in realized savings (for one Service Center)

They have 6 Service Centers using the same tool in the same Region...
### Tangible Benefits ($)

<table>
<thead>
<tr>
<th>Case Name</th>
<th>Average savings per project is $149,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indianapolis Public Schools</td>
<td></td>
</tr>
<tr>
<td>&quot;Owner&quot;</td>
<td></td>
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<tr>
<td>$59,000/year (10 projects)</td>
<td></td>
</tr>
<tr>
<td>Not considered</td>
<td></td>
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<tr>
<td>Kitchell Contractors</td>
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<tr>
<td>&quot;GC/CM&quot;</td>
<td></td>
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<tr>
<td>LA Unified School District</td>
<td></td>
</tr>
<tr>
<td>&quot;Owner&quot;</td>
<td></td>
</tr>
<tr>
<td>$42,000/year (10 projects)</td>
<td></td>
</tr>
<tr>
<td>Not considered</td>
<td></td>
</tr>
<tr>
<td>Manhattan Construction Company</td>
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<tr>
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<tr>
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<td>&quot;Owner&quot;</td>
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<tr>
<td>$59,000/year (18 projects)</td>
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<td>Not considered</td>
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<tr>
<td>P.J. Dick Incorporated</td>
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<td>Indianapolis Public Schools</td>
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<tr>
<td>$536,500/year (10 projects)</td>
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<tr>
<td>Not considered</td>
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**However:** One may argue that this is subjective

**Because:** Savings pass from one to another...

It is very difficult to document how much is being printed, mailed, copied between parties...

Although tangible benefits are quantifiable in monetary terms, they are minor (both from investors’ and collaborators’ point of views) as compared to the rest...

“We focused on organizational-level benefits rather than individual project-level benefits. The reason for this is that business benefits rather than cost savings have always been more important our organization.”

Steve Head, Service Support Manager at Nationwide Building Society

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*Cost/Program Ratio*

Intangible Benefits

Quasi-tangible Benefits

Tangible Benefits ($)

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Steve Head, Service Support Manager at Nationwide Building Society

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### Quasi-tangibles: increased value

<table>
<thead>
<tr>
<th>answer rate</th>
<th>ranking</th>
<th>effectiveness benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>37/38</td>
<td>4.35/5</td>
<td>Improved data availability</td>
</tr>
<tr>
<td>37/38</td>
<td>4.19/5</td>
<td>Enabled having complete audit trail</td>
</tr>
<tr>
<td>37/38</td>
<td>4.00/5</td>
<td>Improved information management</td>
</tr>
<tr>
<td>36/38</td>
<td>4.00/5</td>
<td>Enabled faster reporting and feedback</td>
</tr>
<tr>
<td>38/38</td>
<td>3.97/5</td>
<td>Provided accurate and timely information to give valid/accurate decisions</td>
</tr>
<tr>
<td>38/38</td>
<td>3.95/5</td>
<td>Improved process automation (RFIs/COs, automatic updated master budget, etc)</td>
</tr>
<tr>
<td>29/38</td>
<td>3.93/5</td>
<td>Improved information version control</td>
</tr>
<tr>
<td>37/38</td>
<td>3.84/5</td>
<td>Enabled better project/program control</td>
</tr>
<tr>
<td>36/38</td>
<td>3.61/5</td>
<td>Improved timely capture of design/construction decisions</td>
</tr>
<tr>
<td>37/38</td>
<td>3.57/5</td>
<td>Enabled fewer information bottlenecks</td>
</tr>
<tr>
<td>36/38</td>
<td>3.56/5</td>
<td>Enhanced working within virtual teams</td>
</tr>
<tr>
<td>32/38</td>
<td>3.47/5</td>
<td>Enabled quicker response to project status and budget</td>
</tr>
<tr>
<td>32/38</td>
<td>3.41/5</td>
<td>Improved quality of the output</td>
</tr>
<tr>
<td>28/38</td>
<td>3.29/5</td>
<td>Enabled better forecasting and control</td>
</tr>
<tr>
<td>35/38</td>
<td>3.26/5</td>
<td>Improved project relationships with strategic partners</td>
</tr>
<tr>
<td>30/38</td>
<td>3.20/5</td>
<td>Reduced rework/data reentry</td>
</tr>
<tr>
<td>34/38</td>
<td>3.06/5</td>
<td>Enabled better resource allocation; more effective assembly of project teams</td>
</tr>
<tr>
<td>22/38</td>
<td>3.05/5</td>
<td>Improved public relations</td>
</tr>
<tr>
<td>34/38</td>
<td>3.03/5</td>
<td>Reduced personnel costs due to improved efficiency</td>
</tr>
<tr>
<td>35/38</td>
<td>2.94/5</td>
<td>Improved idea sharing among team members/within organization</td>
</tr>
<tr>
<td>32/38</td>
<td>2.94/5</td>
<td>Minimized project/business risks</td>
</tr>
<tr>
<td>23/38</td>
<td>2.91/5</td>
<td>Enabled faster launch to market due to faster delivery</td>
</tr>
<tr>
<td>33/38</td>
<td>2.88/5</td>
<td>Reduced errors &amp; omissions</td>
</tr>
<tr>
<td>23/38</td>
<td>2.87/5</td>
<td>Reduced delivery lead times</td>
</tr>
<tr>
<td>16/38</td>
<td>2.75/5</td>
<td>Enabled better inventory management</td>
</tr>
<tr>
<td>18/38</td>
<td>2.56/5</td>
<td>Enabled more effective identification and assessment of new suppliers</td>
</tr>
<tr>
<td>24/38</td>
<td>2.38/5</td>
<td>Enabled advance purchase of materials</td>
</tr>
<tr>
<td>Case Name</td>
<td>Role</td>
<td>Benefits Identified</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>Innascape Corporation</td>
<td>&quot;Supplier&quot;</td>
<td>Not considered</td>
</tr>
<tr>
<td>TRM Healthcare</td>
<td>&quot;Owner&quot;</td>
<td>1 identified:</td>
</tr>
<tr>
<td>P.J. Dick Incorporated</td>
<td>&quot;GC/CM&quot;</td>
<td>4 identified:</td>
</tr>
<tr>
<td>Nationwide Building</td>
<td>&quot;Owner&quot;</td>
<td>Not considered</td>
</tr>
<tr>
<td>P.L. Sloik Incorporated</td>
<td>&quot;GC/CM&quot;</td>
<td>2 identified:</td>
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<tr>
<td>Indianapolis Public</td>
<td>&quot;Owner&quot;</td>
<td>Not considered</td>
</tr>
<tr>
<td>ITG Group</td>
<td>&quot;Owner&quot;</td>
<td>4 identified:</td>
</tr>
<tr>
<td>Inscape Corporation</td>
<td>&quot;Supplier&quot;</td>
<td>Not considered</td>
</tr>
<tr>
<td>LA Unified School</td>
<td>&quot;Owner&quot;</td>
<td>Not considered</td>
</tr>
<tr>
<td>Manhattan Construction</td>
<td>&quot;Owner&quot;</td>
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<td>Kitchell Contractors</td>
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<td>P.L. Sloik Incorporated</td>
<td>&quot;GC/CM&quot;</td>
<td>2 identified:</td>
</tr>
</tbody>
</table>

Would lose:
- their control of the overall program,
- information availability to make valid decisions,
- advantage in resolving disputes,
- efficient communication and coordination,
- their ability to enforce the work flow and data population,
- individual’s time,
- accountability and accessibility,
- ownership of the data,
- standardization throughout their projects.

Quasi-tangible Benefits (rating):

- Competitive Advantage
- Market Access and Exposure
- Better Customer Relations
- Negotiation Power
- Process Reengineering
- Realization of ambitious schedule
- Supply chain integration
- Knowledge Management
- Performance Measurement
- Process Reengineering
- Not identified
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
- Not released
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
main contractors performance; reward or reduce workload benchmarking exercise enable statistics/performance reports e.g. final cost vs. budget costs contractors can measure their own processes and make changes if needed

Intangibles: new services

Run Reports on Progress and Calculate KPIs
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Assessment & Reengineering; discovery and formalization of extended- business processes
OCPM Technologies Exposed: *Value of OCPM Software and Services*  |  March 9th, 2006  |  Burçin Becerik  |  20/50

**Intangibles: new services**
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
helps to solve people's problems
specialty interests groups/projects built into the tool
q&a, discussion rooms, libraries
capture ideas/knowledge
find agendas, project/contact information, names/contacts of experts
Intangibles: new services

TEAMROOM

Sustainability - Community of Practice

FROM:          FAO:          DATE: 2003-11-10 12:50:11.00
SUBJECT: Pest Control/Waste          [rate]          [reply]
BODY:          BODY:          BODY:          BODY:
Following a recent audit, I highlighted that a couple of my pest control providers,
as one of their practices, buried their pest waste in the grounds of their own
 premises. I have spoken with the Environmental Agency with regard to this subject
and I am getting conflicting advice as to whether this is an illegal practice or not.
I feel it is, and that Waste Disposal Licence and an approved waste disposal route
is required. Has anyone else experienced this situation and, if so has it led to a
conclusion and could you share this information with me?

FROM:          FAO:          DATE: 2003-11-14 12:50:38.00
SUBJECT: RE: Pest Control/Waste          [rate]          [reply]
BODY:          BODY:          BODY:          BODY:
We have looked into it previously during duty of care audits we carry out for BT.
The conclusion we reached with some input from the local Environment Agency
office was that the pest waste is 'waste' in respect of its legal definition and that
burial of pest waste is NOT an exempt activity from the waste management
licensing regulations. Furthermore, clinical waste guidance may be applicable,
depending on the nature of the waste. The Environment Agency web-site gives
some guidance on pest control which indicates that the duty of care requirements
hope this helps.

FROM:          FAO:          DATE: 2003-12-03 15:30:29.00
SUBJECT: RE: Pest Control/Waste          [rate]          [reply]
BODY:          BODY:          BODY:          BODY:
Better late than never!

To clear up the fundamental point - no it is not illegal to bury rodenticide as a
means of disposal - in fact most manufacturers list burn and bury as the two most
common means of disposal.

Being a bit of a cynic I frankly do not believe people who say they bury
rodenticide. Where do they bury it? In the garden? How big are these companies?
1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image

when the argument is: can you deliver the project without an OCPM solution?

“This technology do certain things when you do traditional process but when you are looking at hundreds and thousands of projects in a small span of time, then one has to look at the technology and nobly say how can we re-do the old process?”

Marek Suchocki, Research and Innovation Manager, Atkins Management Consultants
Intangibles: new services
Intangibles: **new services**

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage

“In the Washington, DC region, we use the tool in more and more projects due to increasing contract requirements. There is more interest in its use from our clients, and how quickly we can place the tool is very important when we are doing some large projects.”

Mike Parkinson, Project Manager, Manhattan Construction Company
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage
7. Gained Market Access
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth

“The relations we build are far bigger than we could think about in the absence of this tool.”
Atul Bali, Executive Vice President, Channel Management, Inscape Corporation

“Getting involved in the project sooner, this is one way that we can spark up in the conversation sooner. This is extremely important for our sales.”
Dan Kennedy, Sales Analyst, Specification Coordinator
Intangibles: *new services*

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage
7. Gained Market Access
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth
11. Forecasting
budget constraints and potential costs
project and master budget
cost codes are tied to the accounting system
anticipated costs vs. projected budget
what funds are available for each project and what has been spent to date in any given region?

“The single biggest benefit is that we can see where the trends are going and we have the power to do something before it is too late.”

Charlie Anderson, LAUSD Program Manager
Intangibles: new services

1. Supply Chain Integration
2. Performance Measurement
3. Process Reengineering
4. Knowledge Management
5. Improved Company Image
6. Gained/maintained Competitive Advantage
7. Gained Market Access
8. Improved Customer Relationships
9. Gained Negotiation Power
10. Increased Market Share; space and capacity for business growth
11. Forecasting
12. Claims Mitigation and Management
“I was involved with a project in San Diego. We had everything in Primavera. This was the first series of heavy storms. The contractor have started the excavation but they actually lost part of their job site because of flooding. The questions came up about who is responsible for the erosion control. It was the time when most of files were displaced and some were destroyed. What we found out is during the pre-bid process, there was a significant RFI that came in from one of the contractors asking if erosion control is supposed to be in earth work contract. The response came back from the owner as it was. We didn’t know that the same contractor who filed the claim wrote a letter stating that they wanted to verify that the erosion control would in fact be included in their contract control even though it wasn’t stated in the bid documents. It was signed by the same gentleman who was filing the claim. The overall claim was about $300,000. The district paid $35,000 because we considered it as a natural disaster. That one claim itself paid for the entire system.”

David Page, Facilities Information Systems, LAUSD
<table>
<thead>
<tr>
<th>Case Name</th>
<th>Tangible Benefits ($)</th>
<th>Quasi-tangible Benefits (rating)</th>
<th>Intangible Benefits (identification)</th>
<th>Cost/Program Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indianapolis Public Schools</td>
<td>$59,000/year (10 projects)</td>
<td>3.94/5.00 20 benefits out of 27</td>
<td>Not identified</td>
<td>0.07% (considers 1st phase program)</td>
</tr>
<tr>
<td><em>Owner</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inscape Corporation</td>
<td>Not considered</td>
<td>3.48/5.00 12 benefits out of 27</td>
<td>4 identified: Increased Sales, Market Access and Expose, Better Customer Relation, Negotiation Power.</td>
<td>Pass the cost to the owner</td>
</tr>
<tr>
<td><em>Supplier</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITG Group</td>
<td>Not considered</td>
<td>4.04/5.00 21 benefits out of 27</td>
<td>2 identified: Process Reengineering, Realization of ambitious schedule.</td>
<td>0.1% (the cost includes development of the software)</td>
</tr>
<tr>
<td><em>Owner</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kitchell Contractors</td>
<td>$42,000/year (10 projects)</td>
<td>3.50/5.00 15 benefits out of 27</td>
<td>Not identified</td>
<td>Pass the cost to the owner</td>
</tr>
<tr>
<td><em>GC/CM</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LA Unified School District</td>
<td>Not considered</td>
<td>3.80/5.00 19 benefits out of 27</td>
<td>2 identified: Forecasting, Risk Management.</td>
<td>0.02% (considers 2nd phase program &amp; includes develop. fees)</td>
</tr>
<tr>
<td><em>Owner</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manhattan Construction Company</td>
<td>$59,000/year (18 projects)</td>
<td>3.64/5.00 14 benefits out of 27</td>
<td>Not identified</td>
<td>0.04% (assumes the firm has at least 4 $100mil. projects every year)</td>
</tr>
<tr>
<td><em>GC/CM</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nationwide Building Society</td>
<td>Not considered</td>
<td>3.90/5.00 25 benefits out of 27</td>
<td>4 identified: Supply Chain Integration, Knowledge Management, Performance Measurement, Process Reengineering.</td>
<td>0.15% (the cost includes development of the software: PM &amp; KM)</td>
</tr>
<tr>
<td><em>Owner</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P.J. Dick Incorporated</td>
<td>$47,100/year (10 projects)</td>
<td>3.50/5.00 20 benefits out of 27</td>
<td>1 identified: Competitive Advantage</td>
<td>not released*</td>
</tr>
<tr>
<td><em>GC/CM</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRM Healthcare</td>
<td>$536,500/year (10 projects)</td>
<td>3.65/5.00 13 benefits out of 27</td>
<td>Not identified</td>
<td>not released*</td>
</tr>
<tr>
<td><em>Owner</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## OCPM Technologies Exposed: Value of OCPM Software and Services

<table>
<thead>
<tr>
<th>Case Name</th>
<th>Type</th>
<th>Cost/Program Ratio</th>
<th>Total Cost/Year</th>
<th>Total Benefits</th>
<th>Intangible Benefits</th>
<th>Quasi-tangible Benefits</th>
<th>Tangible Benefits ($)</th>
<th>Projects</th>
<th>Identified Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indianapolis Public Schools</td>
<td>&quot;Owner&quot;</td>
<td>0.15% (includes customization)</td>
<td>$59,000/year (10 projects)</td>
<td>3.94/5.00</td>
<td>22 benefits out of 27</td>
<td>&quot;not released&quot;</td>
<td>Not identified</td>
<td>10</td>
<td>&quot;not released&quot;</td>
</tr>
<tr>
<td>TRM Healthcare</td>
<td>&quot;Owner&quot;</td>
<td>0.15% (the cost includes development of the software)</td>
<td>$47,100/year (10 projects)</td>
<td>3.46/5.00</td>
<td>12 benefits out of 27</td>
<td>Increased Sales, Market Access and Exposure, Better Customer Relation, Negotiation Power</td>
<td>&quot;not released&quot;</td>
<td>10</td>
<td>4 Identified: Supply Chain Integration, Knowledge Management, Performance Measurement, Process Reengineering</td>
</tr>
<tr>
<td>Nationwide Building Society</td>
<td>&quot;Owner&quot;</td>
<td>0.15% (the cost includes development of the software)</td>
<td>$536,500/year (10 projects)</td>
<td>3.85/5.00</td>
<td>13 benefits out of 27</td>
<td>&quot;not released&quot;</td>
<td>Not identified</td>
<td>10</td>
<td>&quot;not released&quot;</td>
</tr>
<tr>
<td>Kitchell Contractors</td>
<td>&quot;GC/CM&quot;</td>
<td>0.02% (considers 2nd phase program &amp; includes develop. fees)</td>
<td>$63,000/year (10 projects)</td>
<td>3.80/5.00</td>
<td>18 benefits out of 27</td>
<td>Forecasting, Risk Management</td>
<td>&quot;not released&quot;</td>
<td>10</td>
<td>2 Identified: Forecasting, Risk Management</td>
</tr>
<tr>
<td>Nationwide Building Society</td>
<td>&quot;Owner&quot;</td>
<td>0.04% (assumes the firm has at least 4 $100mil. projects every year)</td>
<td>$59,000/year (10 projects)</td>
<td>3.64/5.00</td>
<td>14 benefits out of 27</td>
<td>&quot;not released&quot;</td>
<td>Not identified</td>
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<td>&quot;not released&quot;</td>
</tr>
<tr>
<td>Manhattan Construction Company</td>
<td>&quot;GC/CM&quot;</td>
<td>0.1%</td>
<td>$63,000/year (10 projects)</td>
<td>3.64/5.00</td>
<td>14 benefits out of 27</td>
<td>&quot;not released&quot;</td>
<td>Not identified</td>
<td>18</td>
<td>&quot;not released&quot;</td>
</tr>
<tr>
<td>S.B. Dick Incorporated</td>
<td>&quot;GC/CM&quot;</td>
<td>0.02% (considers 1st phase program)</td>
<td>$47,100/year (10 projects)</td>
<td>3.56/5.00</td>
<td>15 benefits out of 27</td>
<td>Competitive Advantage</td>
<td>&quot;not released&quot;</td>
<td>10</td>
<td>1 Identified: Competitive Advantage</td>
</tr>
</tbody>
</table>

### Highest cost/program ratio = **0.15%** (includes customization)

### Lowest cost/program ratio = **0.02%**

**Commercially sensitive**

- Indianapolis Public Schools
- TRM Healthcare
- Nationwide Building Society
- Nationwide Building Society

**Highest cost/program ratio = 0.15% (includes customization)**

**Lowest cost/program ratio = 0.02%**

**Case Name**

- Indianapolis Public Schools
- TRM Healthcare
- Nationwide Building Society
- Nationwide Building Society
- Manhattan Construction Company
- S.B. Dick Incorporated
- Nationwide Building Society

**Type**

- Indianapolis Public Schools: "Owner"
- TRM Healthcare: "Owner"
- Nationwide Building Society: "Owner"
- Nationwide Building Society: "Owner"
- Manhattan Construction Company: "GC/CM"
- S.B. Dick Incorporated: "GC/CM"
- Nationwide Building Society: "Owner"

**Cost/Program Ratio**

- Indianapolis Public Schools: 0.15%
- TRM Healthcare: 0.15%
- Nationwide Building Society: 0.15%
- Nationwide Building Society: 0.04%
- Manhattan Construction Company: 0.02%
- S.B. Dick Incorporated: 0.02%
- Nationwide Building Society: 0.15%
- Nationwide Building Society: 0.07%

**Total Cost/Year**

- Indianapolis Public Schools: $59,000/year
- TRM Healthcare: $47,100/year
- Nationwide Building Society: $536,500/year
- Nationwide Building Society: $59,000/year
- Manhattan Construction Company: $63,000/year
- S.B. Dick Incorporated: $47,100/year
- Nationwide Building Society: $59,000/year
- Nationwide Building Society: $536,500/year

**Total Benefits**

- Indianapolis Public Schools: 3.94/5.00
- TRM Healthcare: 3.46/5.00
- Nationwide Building Society: 3.85/5.00
- Nationwide Building Society: 3.64/5.00
- Manhattan Construction Company: 3.80/5.00
- S.B. Dick Incorporated: 3.56/5.00
- Nationwide Building Society: 3.64/5.00
- Nationwide Building Society: 3.56/5.00

**Intangible Benefits**

- Indianapolis Public Schools: "not released"
- TRM Healthcare: "not released"
- Nationwide Building Society: "not released"
- Nationwide Building Society: "not released"
- Manhattan Construction Company: "not released"
- S.B. Dick Incorporated: "not released"
- Nationwide Building Society: "not released"
- Nationwide Building Society: "not released"

**Quasi-tangible Benefits**

- Indianapolis Public Schools: "not released"
- TRM Healthcare: "not released"
- Nationwide Building Society: "not released"
- Nationwide Building Society: "not released"
- Manhattan Construction Company: "not released"
- S.B. Dick Incorporated: "not released"
- Nationwide Building Society: "not released"
- Nationwide Building Society: "not released"

**Tangible Benefits**

- Indianapolis Public Schools: $59,000/year
- TRM Healthcare: $47,100/year
- Nationwide Building Society: $59,000/year
- Nationwide Building Society: $59,000/year
- Manhattan Construction Company: $63,000/year
- S.B. Dick Incorporated: $47,100/year
- Nationwide Building Society: $59,000/year
- Nationwide Building Society: $536,500/year

**Projects**

- Indianapolis Public Schools: 10
- TRM Healthcare: 10
- Nationwide Building Society: 10
- Nationwide Building Society: 10
- Manhattan Construction Company: 18
- S.B. Dick Incorporated: 10
- Nationwide Building Society: 10
- Nationwide Building Society: 10

**Identified Benefits**

- Indianapolis Public Schools: 22
- TRM Healthcare: 12
- Nationwide Building Society: 13
- Nationwide Building Society: 13
- Manhattan Construction Company: 14
- S.B. Dick Incorporated: 15
- Nationwide Building Society: 25
- Nationwide Building Society: 22

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OCPM Technologies Exposed: Value of OCPM Software and Services  | March 9th, 2006 | Burçin Becerik | 33/50
Enhancements:

- Robust tools should fit the nature of projects
- Flexible tools with customizable modules
- Intelligent Workflows
- Object based as opposed to document based
- Cross-referenced objects
- Capturing Paper Documents
- Ease of Use
- Desktop Integration
- Interoperability
- Strong Management Support + Training and Contractual Requirement
Trends:

• Convinced that OCPM technology is invaluable and becoming a standard way

• “It is not only the technology!” and “the next big step is the implementation!”
  • Overcoming change and cultural barriers
  • Matched processes
  • Integration of OCPM solution with key software
  • Training, mandating, supporting the implementation

• Extended use:
  • More modules used by more collaborators
  • Easily reusing and reconfiguring the OCPM solution
  • Using the knowledge collected
Who are the major buyers of OCPM technology?

• **Long-term Owners** whose core business is not construction but who *KEEP* the building
  
e.g. banks, pharmaceutical companies, schools, automobile manufacturers …

• Large and mid-size **General Contractors**
  
e.g. Bechtel, PJ Dick, Kitchell …
Who invests on OCPM technology?

Clients of OCPM technology providers by count – based on 46,500 projects (*sponsor aggregate data)
Why don’t subcontractors and suppliers use OCPM technology?

- “In general”, they are **not given access** to the systems; cost and security
- They are **not technology savvy**
- Usually **benefits overpass them**; one cannot see the others work progress, etc
- They are **not permanent** in the project; their role is limited
What types of projects are managed by OCPM tools?

Project types – based on ~ 17,900 projects (*sponsor aggregate data)
Is OCPM technology more favorable for multiple and repetitive projects?

- **Owner control** over projects/program across projects, stop/divert problems
- **Set standards** for repetitive projects; e.g. renovations
- **Customize** the OCPM tool according to your needs
- **Negotiate the cost** of the OCPM technology; economies of scale
- **Learn** from the mistakes / other peoples’ experiences
- **Effective coordination** of sheer number of participants
In which project stage OCPM tools are used most?

- Close Out: 23%
- Construction: 17%
- Planning: 21%
- Completed: 9%
- Cancelled: 16%
- Bidding: 3%
- Permitting: 2%
- Awaiting Approval: 3%
- Pending/On Hold: 3%
- Design: 3%

Project status – based on ~ 30,000 projects (*sponsor aggregate data)
Why is OCPM technology used more in construction?

**DESIGN:**
- Architects don’t want the owner to monitor
- Few players collaborating
- Design process is fluid and it is not hierarchical
- Tools are enough; you don’t need any more functionality

**CONSTRUCTION:**
- Information is in one place
- Control dissemination of the information
- Communication is transparent
- Many parties who execute orders are involved; they are not equal
- Interdependencies of the parties
- Forces accountability
- Small KM depository
- There is a record of the project
What is the average duration of use?

Average duration of use per project – based on ~ 5,700 projects (*sponsor aggregate data)
Average duration of usage is 8.2 months
Selection process:

Carried out by consultants, owner's project/program managers and/or organization's technology department

1st: Web-based vs. web-enabled: firewalls, security, sensitivity, resources
2nd: Vendor: responsiveness, company stability, system integrity, training availability

Sometimes: Request for Quotation
Mostly: Demonstration or Testing
Always: Recommendations
The cost:

- **Sensitive issue**
- **Renewed** 3-5 year contracts
- **Unlimited** number of users, space, projects
- No **industry standard**
  - Subscription base
  - License + maintenance
  - Negotiated fix cost
  - Exclusive business partnership agreement
Implementation:

Investors work with the vendor/consultants to customize/tailor the tool to match the process. Testing, workshops, analysis and evaluation/enhancement.

Owner/GC:

- Contractually mandates the use and training
- Provides free access and training
Who uses OCPM technology?

Client type by unique logins based on ~ 21,000 projects (*sponsor aggregate data)
How many users per project do collaborate?

Active user numbers per project based on ~ 46,600 projects (*sponsor aggregate data)
Average number of users per project is 13.3 persons
What are the most used modules?

Types of entries – based on ~46,000 projects (*sponsor aggregate data)
Success:

- Strategic implementation plans
- Vision, commitment and re-engineering
- Make proactive arrangements: Champion
- Factor the solution early on
- Develop business processes built into solution’s capabilities
- Culture, planning and control style, organizational size and structure
- Contractually mandate use and training
- Continual performance monitoring
- Responsive technology provider